Northwest
Concrete Masonry Association

September 14, 2012

Mr. Ray Allshouse, Chair
Washington State Building Code Council
PO Box 41449
Olympia, WA 98504-1449

Mr. Chairman and Council Members:

I am Tom Young, Executive Director and a professional engineer with the Northwest Concrete Masonry Association (NWCMA). I represent the masonry construction industry in the northwest.

I am testifying today in support of the proposed code change to masonry reinforcement lap splice lengths, Sections 2107.2. and 2107.2.1. (WAC 21070) This code section applies to allowable stress design (ASD).

The only change from the current code provision is to establish a maximum lap length of 72 times the bar diameter. It will make the ASD maximum lap length equivalent to the strength design requirement. This change will lower construction costs while maintaining an adequate factor of safety. I ask you to approve this item.

Thank you for the opportunity to comment.

Sincerely,

Thomas Young, P.E.
Executive Director
Northwest Concrete Masonry Association

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Mr. Ray Allshouse, Chair
Washington State Building Code Council
PO Box 41449
Olympia, WA 98504-1449

Mr. Chairman and Council Members:

I am Tom Young, Executive Director of the Northwest Concrete Masonry Association (NWCMA). I represent the masonry and concrete construction industry in Washington State. Our industry is comprised of many small businesses engaged in material manufacturing, distribution, and contracting working together with union labor. Our primary interest is the nonresidential construction market.

The NWCMA is the proponent of Option 2 for both thermal envelope tables C402.1.2 and C402.2. One table deals with U-factors and the other R-values. Today I want to "do the math" and discuss some of the numbers comparing Options 1 and 2.

1. Option 1 lowers the nonresidential mass wall U-factor requirement 48% from the current WSEC. This is an extreme change in one code cycle. Option 2 also lowers the U-factor requirement, but by a more reasonable 30%, even though a strong cost/benefit argument can be made for not changing the current WSEC mass wall requirements. Our proposed U-factor reduction uses the same number as found in the latest ASHRAE 90.1 standard and is therefore a very rational value.
2. Option 1 **doubles** the continuous insulation R-value requirement for mass walls. This is too big a change at once.
3. Option 1 increases masonry wall costs by 30-40% yet it would commonly provide less than 5% in energy savings for many masonry commercial building types in the Washington climate. One of the reasons for the minimal energy savings is the result of air conditioning loads actually increasing as excessive levels of insulation, as required by Option 1, are added to massive masonry walls. We have observed this behavior through energy simulation work and seen its impact in analysis of real-world building energy usage data.
4. RCW 19.27A.025 requires energy code changes to be "cost-effective" for building owners. Given the major cost increase required for mass walls along with the minor building energy savings achieved, Option 1 is not a cost-effective choice. Simple payback periods can exceed 100 years for building owners!
   Economic impacts must be considered in the development of energy codes and standards. Local utility Avista, for example, has stated that natural gas is now so abundant and cheap it no longer even pays to offer energy efficiency rebate programs.
5. Option 1 would require mass walls built in moderate Washington climate areas to be insulated to the same levels as walls built in Montana, and much of Minnesota and North

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Dakota which isn't logical and illustrates such a requirement cannot pass the cost-effectiveness test. That is why it is crucial to take a more detailed look at masonry building energy use under specific local conditions and why our proposal differs from the 2012 IECC. Local analysis is encouraged by national codes developers as national codes are typically based upon a one-size-fits-all approach.

In addition to my comments above, the negative economic impact of Option 1 upon the masonry industry needs to be fully considered. We believe it is very significant and therefore respectfully request your support of **Option 2** for Tables C402.1.2 and C402.2. (WAC 402121 and 402200)

There are also some other proposed energy code changes I would like to address today. We request approval of Table A103.3.7.1 (1) for default U-factors for concrete/masonry walls (WAC 610337). This table is currently contained in the WSEC and is based upon local concrete thermal conductivity values. It is also the only readily available source of hollow-brick wall thermal data. It should be maintained.

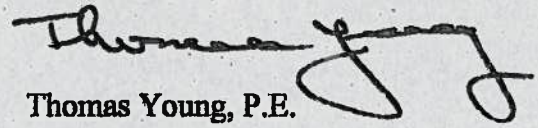
We request denial of both Table A101.5 (WAC 61015) and Table A103.3.7.1(2) (WAC 610337) as they are not necessary and will cause confusion for designers of concrete masonry wall assemblies. The vast majority of this thermal data is available in the code referenced ASHRAE 90.1 standard and it also does not properly represent locally available concrete products. Additionally, Table A103.3.7.1(2) does not specify concrete masonry wall widths and would not be useable. A few years back we were trying to simplify the state code and reduce the number of pages, and now we are proposing to transcribe pages from reference documents into the code. This would not help to clarify requirements or streamline compliance which are stated objectives for this code change cycle.

We support the inclusion of Section C402.1.3, Component Performance Building Envelope Option of the WSEC (WAC 40213). This code section provides an additional code compliance path providing more flexibility for building designers. We also encourage the development of a component trade-off software program such a COMcheck which is a useful compliance tool.

And lastly, we recommend deletion of the last two sentences in the expanded definition of "continuous insulation" found in Section C202.3 (WAC 20203). In conjunction with this action, we also support deletion of footnote ℓ (or f) from Table C402.2 addressing metal penetrations for masonry veneer. Neither this code language nor these provisions come from the IECC, ASHRAE 90.1 or the current WSEC. We are not certain of their origin or validity. It is another example of complicating the code and causing more work for, and potential confusion among, building designers.

Thank you for the opportunity for our industry to be heard on these important issues.

Sincerely,



Thomas Young, P.E.
Executive Director
Northwest Concrete Masonry Association

Northwest
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September 21, 2012

Mr. Ray Allshouse, Chair
Washington State Building Code Council
PO Box 41449
Olympia, WA 98504-1449

Mr. Chairman and Council Members:

I am Tom Young with the Northwest Concrete Masonry Association (NWCMA). Hopefully you will recall my previous testimony regarding proposed energy code changes impacting the masonry/concrete industry. We are suppliers and builders of mass (heavyweight) wall systems for the exterior walls of commercial buildings. Our industry includes many small businesses employing Washingtonians in manufacturing, distribution, and contracting working together with union labor.

The NWCMA is the proponent of Option 2 for both Table C402.1.2 and C402.2 addressing thermal envelope assembly requirements. I will discuss three main topics during my testimony today. They include, 1) how our proposed Option 2 differs from Option 1; 2) cost-effectiveness requirements of code provisions; and 3) impact upon the masonry industry.

Our proposed Option 2 does deviate from the IECC criteria for mass walls. We believe this is justified if you take a detailed look at building energy use using specific local data to develop the correct code values for our state. Such analysis is encouraged by PNL/USDOE and others developing national energy codes which are typically "one-size-fits-all" based. Our approach does make the current state code more stringent while balancing energy efficient building design with associated construction cost impacts as should be done in code development work.

Commercial building types using masonry (mass) wall assemblies are unique. The masonry wall exception portion of Option 2 (footnote d) for integral insulated single-wythe walls addresses this issue and was discussed in much detail during the last code change cycle. **The SBCC voted unanimously to approve it.** This subject has been fully vetted. Our proposal is actually more restrictive than the current state code provision as it limits the exception to specific building types. The listed building types are those where owners prefer hard, durable wall surfaces to be exposed. This keeps maintenance costs down. Fire-safety is increased when walls are constructed of non-combustible materials which are not covered up with less fire-resistive products. It is also good sustainable design practice to use fewer construction materials within a wall assembly that serves multiple functions and one that is durable and long lasting.

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Please keep in mind it is much more difficult and costly (30-40%) to insulate mass walls to high levels than it is for lightweight frame walls. And when you do so you lose many of the benefits provided by mass walls. When you consider industry impacts and the fact it is not cost-effective to highly insulate mass walls in our climate, it makes sense to maintain this exception for specific building types where these walls have historically performed well. (The current Oregon State code contains this same masonry wall exception language. It was a modification to the IECC code version adopted in Oregon and deemed reasonable).

On the other hand, Option 1 would be a drastic change for mass wall requirements in one code cycle. I reviewed some of the numbers at the hearing last week. Furthermore, it does not provide consistency between the mass wall requirements and those of lightweight wall assemblies in our climate zone. Mass walls have more stringent requirements in zone 5 than zone 4 while other walls have the same requirements. Our proposal corrects this inequity. Option 1 also would require mass walls constructed in moderate climate areas of the state to meet the same insulation levels as walls built in Montana, South Dakota, and much of Minnesota and North Dakota which isn't logical.

The Washington State nonresidential energy code provisions are required by the RCWs to be "technically feasible, commercially available, and **cost-effective** to building owners and tenants." It is not cost-effective to require high levels of insulation for the masonry/concrete walls of many commercial building types in Washington state's climate. We believe proposed Option 1 goes too far in one code cycle and is too stringent with its U and R-value prescriptive mass wall requirements. Even the USGBC has recognized the need to slow down the rapid development of green/energy standards. They postponed a ballot on a new LEED version stating it would be "too much, too fast with this moribund economic recovery".

We have employed a mechanical engineer to analyze a typical big-box retail building with current code compliant mass walls in our local climate. Reducing the wall U-factor to a similar level as proposed in Option 1 saves some heating energy, **actually increases the air conditioning load,** and results in minimal energy savings at a large construction expense for the building owner. The payback period is well over 100 years in the western WA climate. This is clearly not cost-effective by any definition. This same conclusion was reached independently by a regional tire retailer when analyzing energy use of their concrete masonry stores located throughout the northwest.

Both this simulation work and the analyses of real-world building energy usage also illustrate that the exterior walls of many commercial building types are not the most important item when considering the total building energy use. The exterior walls represent a rather small percentage of the total. Furthermore, when regional retailers repeatedly build the same building plan in different locations within our moderate climate zone, some with concrete masonry walls and some with lighter-weight, higher insulated walls, there is no significant difference in the total building energy use in many cases. Therefore, requiring a substantial increase in the cost of mass wall system insulation is simply not justified in Washington State. We must make sure we are following the science and economic facts when developing building code requirements.

A strong cost/benefit argument can be made for maintaining the current WSEC mass wall requirements. However, proposed Option 2 does move the Washington state energy code in the direction of more restrictive thermal envelope criteria for mass walls of commercial buildings without going too far in one code cycle. It represents a compromise position and is an incremental step the industry is prepared to take at this time. At the hearing last week we heard comments from practicing architects and researchers supporting our position.

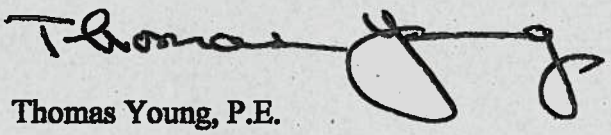
In comparison, Option 1 would be very detrimental to the masonry/concrete industry as you will hear from other industry representatives impacted by the state energy code. I want to stress that these impacts must be measured against the existing WSEC as it represents current construction practice.

In summary, from my testimony today and last week, the Northwest Concrete Masonry Association asks the Council to support the following actions:

1. Approve **Option 2** for Thermal Envelope Tables C402.1.2 and C402.2 (WAC 402121 and 402200).
2. Approve Table A103.3.7.1 (1), Default U-factors for Concrete and Masonry Walls (WAC 610337).
3. Deny Table A103.3.7.1.(2) Default U-factors for Concrete and Masonry Walls (WAC 610337).
4. Deny Table A101.5, Default R-values (WAC 61015).
5. Delete the two sentences of the expanded definition of "continuous insulation" found in section C202.3 (WAC 20203).
6. Remove isolated metal penetrations footnote *ℓ* (or f) from Table C402.2 (WAC 402200).

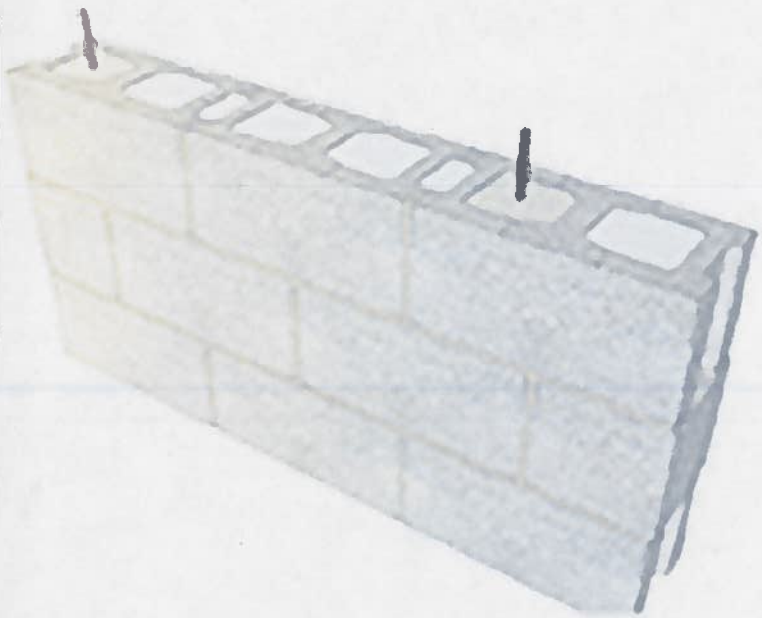
The opportunity to speak on these important issues is appreciated. Thank you for your attention to my comments.

Sincerely,

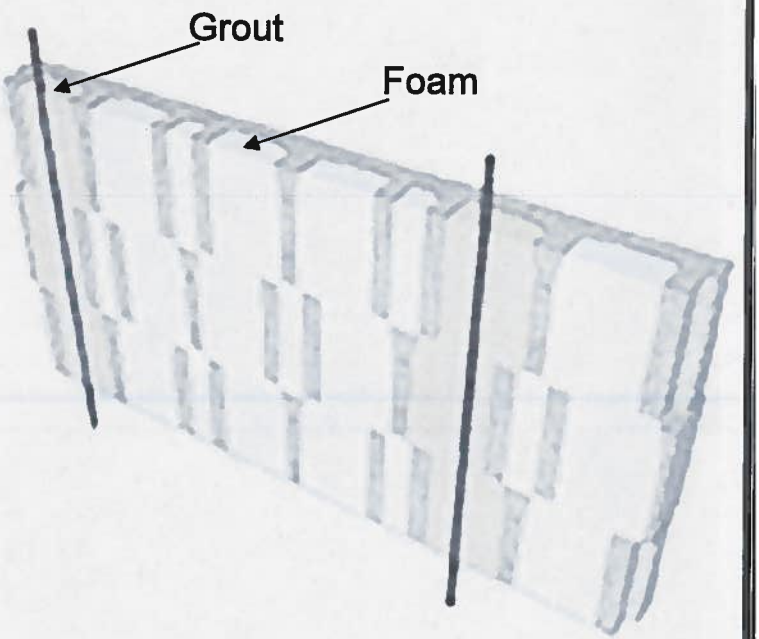


Thomas Young, P.E.
Executive Director
Northwest Concrete Masonry Association

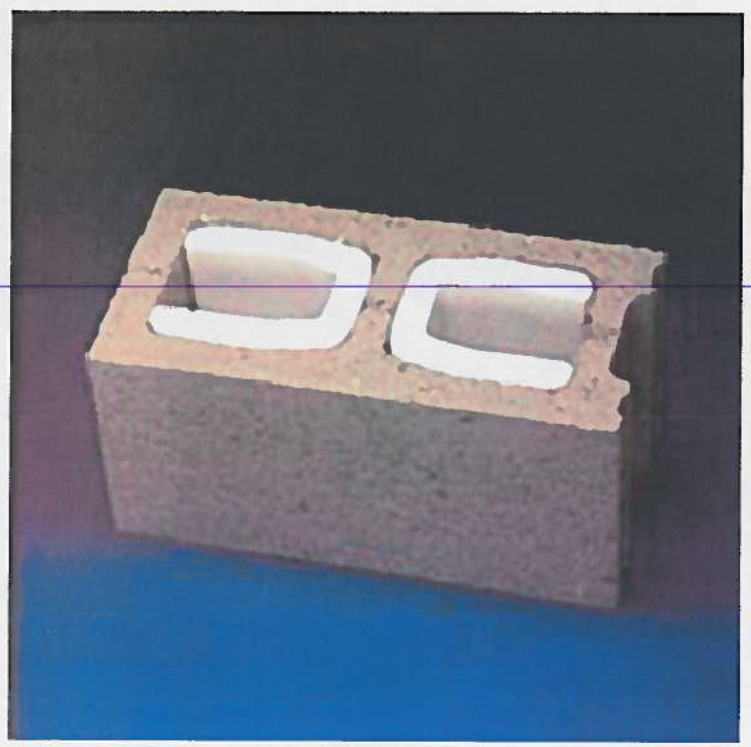
Integral Insulated Concrete Masonry Block

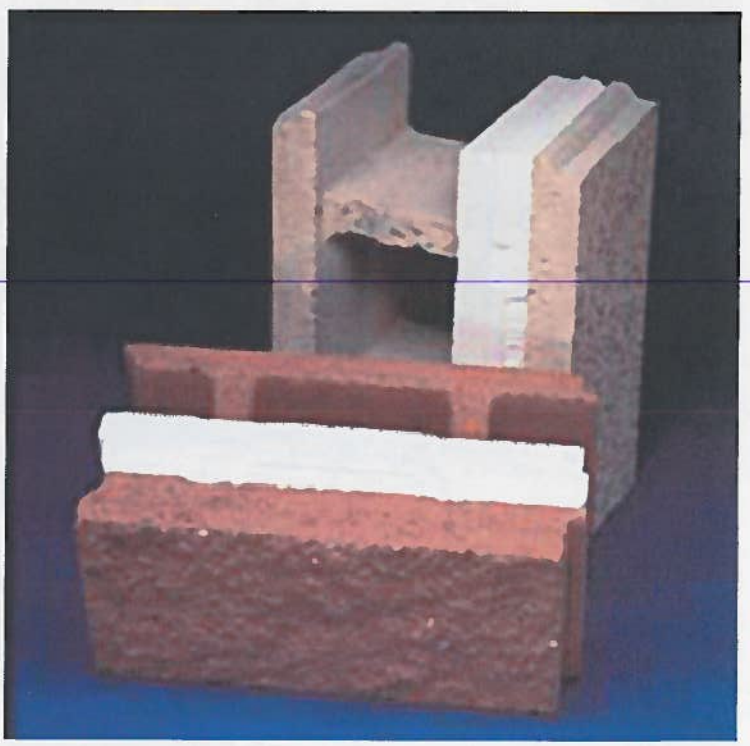


Partial grouted wall with foam or loose-fill insulation inside



Longitudinal section view with insulation at non-grouted cells





Pre-insulated concrete masonry block